

8 an epitaxial layer formed on [a silicon] the substrate[,  
9 wherein said first vertical type bipolar transistor has] above  
10 the datum surface and having an epitaxial impurity  
11 concentration and an epitaxial conductive type;

12 a first embedded diffusion layer formed as part of a  
13 first vertical type bipolar transistor in [an] a first upper  
14 part of [said silicon] the substrate;

15 [and having an impurity concentration higher than that of  
16 said epitaxial layer, said second vertical type bipolar  
17 transistor having]

18 a second embedded diffusion layer formed as part of a  
19 second vertical type bipolar transistor in [an] a second upper  
20 part of [said silicon] the substrate,

21 [and of the same conductive type as said epitaxial  
22 layer,]

23 wherein the second embedded diffusion layer includes an  
24 impurity concentration [of said second embedded diffusion  
25 layer] that is less than the impurity concentration of [said]  
26 the first embedded diffusion layer, and

27 [and is approximately equal to or higher than the  
28 impurity concentration of said epitaxial layer; wherein the  
29 depth of said second embedded diffusion layer is deeper than  
30 that of said first embedded diffusion layer, and]

31 wherein a peak position of an impurity concentration of  
32 the first embedded diffusion layer resides at a first distance  
33 from the datum surface of the substrate and a peak position of  
34 an impurity concentration of the second embedded diffusion  
35 layer resides at a second distance from the datum surface of  
36 the substrate such that the first distance is greater than the  
37 second distance.

38 [a region formed between said silicon substrate and a base  
39 region of said second vertical type bipolar transistor is  
40 deeper than that of a region formed between said silicon  
41 substrate and a base region of said first vertical bipolar  
42 transistor.]

Sub H<sup>2</sup> 1 3. (Amended Two Times) A semiconductor device according  
2 to claim 1,  
3 wherein the first embedded diffusion layer is formed at a  
4 third distance from the datum surface of the substrate,  
5 wherein the second embedded diffusion layer is formed at  
6 a fourth distance from the datum surface of the substrate such  
7 that the fourth distance is less than the third distance.  
8 [a depth of said first embedded diffusion layer is  
9 shallower than a depth of said second embedded diffusion  
10 layer.]

1 4. (Amended Two Times) A semiconductor device according  
2 to claim 1, wherein the impurity concentration of [said] the  
3 second embedded diffusion layer is at least [as great as]  
4 equal to the impurity concentration of [said] that portion of  
5 the epitaxial layer formed above [said] the second embedded  
6 diffusion layer.

Sub 3 1 6 (Amended Two Times) A semiconductor device according to  
2 claim 1, wherein the substrate is a single substrate, wherein  
3 the datum surface is a bottom surface of the substrate, and  
4 wherein the impurity concentration of [said] the second  
5 embedded diffusion layer is  $1 \times 10^{13}$  to  $1 \times 10^{15}$ .

G<sup>4</sup> 1 17. (Amended Two Times) A semiconductor device according  
2 to claim 1, further comprising:

3 a third embedded diffusion layer having a conductive type  
4 that is the opposite of the epitaxial conductive type; and  
5 [a third vertical type bipolar transistor having]  
6 a separating diffusion layer formed in [an] a third upper  
7 part of [said silicon] the substrate [for separating from said  
8 silicon] to separate from the substrate [a] the third embedded  
9 diffusion layer [having an opposite conductive type to that of  
10 said epitaxial layer].

1 19. (Amended One Time) A semiconductor device according  
2 to claim 1, wherein [said] the epitaxial layer is an effective  
3 collector layer.

1 20. (Amended One Time) A semiconductor device according  
2 to claim 1, wherein [said] the second embedded diffusion layer  
3 is an effective collector layer.

1 21. (New) A semiconductor device according to claim 1,  
2 wherein the impurity concentration of the second embedded  
3 diffusion layer is approximately equal to or higher than the  
4 epitaxial impurity concentration at all distances from the  
5 datum surface of the substrate beyond the peak position of the  
6 impurity concentration of the second embedded diffusion layer.

1 22. (New) A semiconductor device according to claim 1,  
2 wherein a peak position of an impurity concentration of the  
3 second embedded diffusion layer resides at a distance from the  
4 datum surface of the substrate that is approximately equal to  
5 a location of the bottom of the first embedded diffusion layer  
6 from the datum surface of the substrate.

1 23. (New) A semiconductor device according to claim 1,  
2 wherein the first vertical type bipolar transistor defines a

3 voltage that is different than the a second vertical type  
4 bipolar transistor,

5 wherein the substrate is a silicon substrate,

6 wherein the first embedded diffusion layer includes an  
7 impurity concentration that is higher than the epitaxial  
8 impurity concentration, and

9 wherein the second embedded diffusion layer defines a  
10 conductive type that is the same as the epitaxial conductive  
11 type.